Medical Terminology for Medical Assistants
Part VII: The Urinary System

Overview of Structures, Combining Forms, and Functions of the Urinary System

Major Structures	Related Combining Forms	Primary Functions
Kidneys	nephr/o, ren/o	Filter the blood to remove waste products, maintain electrolyte concentrations, and remove excess water to maintain the fluid volume within the body.
Renal Pelvis	pyel/o	Collects urine produced by the kidney.
Urine	ur/o, urin/o	Liquid waste products to be excreted.
Ureters	ureter/o	Transport urine from the kidneys to the bladder.
Urinary Bladder	cyst/o	Stores urine until it is excreted.
Urethra	urethra/o	Transports urine from the bladder through the urethral meatus, where it is excreted from the body.

Functions of the Urinary System

The urinary system performs many functions that are important in maintaining **homeostasis** (**hoh**-mee- oh-**STAY**-sis), which is a state of equilibrium that produces a constant internal environment throughout the body (**home/o** means sameness and **-stasis** means control). To achieve this, the urinary system:

- Maintains the proper balance of water, salts, and acids in the body fluids by removing excess fluids from the body or reabsorbing water as needed.
- Constantly filters the blood to remove urea and other waste materials from the bloodstream. **Urea** (you-**REE**-ah) is the major waste product of protein metabolism.
- Converts these waste products and excess fluids into urine in the kidneys and excretes them from the body via the urinary bladder.

Structures of the Urinary System

- The urinary system, also referred to as the **urinary tract,** consists of two kidneys, two ureters, one bladder, and a urethra. The adrenal glands, which are part of the endocrine system, are located on the top of the kidneys.

The Nephrons

- **Nephrons** (**NEF**-rons) are the functional units of the kidneys. They form urine by the processes of filtration, reabsorption, and secretion.

The Ureters

- The **ureters** (you-**REE**-ters) are narrow tubes, each about 10 to 12 inches long. Each ureter carries urine from a kidney to the urinary bladder. Peristalsis moves urine downward toward the bladder.

The Urinary Bladder

- The **urinary bladder** is a hollow muscular organ that is a reservoir for urine.

The Urethra

- The **urethra** (you-**REE**-thrah) is the tube extending from the bladder to the outside of the body. *Caution*: The spellings of *ureter* and *urethra* are very similar!

Medical Specialties Related to the Urinary System

- A **nephrologist** (neh-**FROL**-oh-jist) specializes in diagnosing and treating diseases and disorders of the kidneys (**nephr** means kidney and -**ologist** means specialist).
- A **urologist** (you-**ROL**-oh-jist) specializes in diagnosing and treating diseases and disorders of the urinary system of females and the genitourinary system of males (**ur** means urine and -**ologist** means specialist). The term *genitourinary* refers to both the genital and urinary organs.

Renal Failure

- **Renal failure**, also known as **kidney failure**, is the inability of one or both of the kidneys to perform their functions. The body cannot replace damaged nephrons. When too many nephrons have been destroyed, the result is kidney failure.

Stones

- A **stone**, also known as **calculus** (**KAL**-kyou-luhs), is an abnormal mineral deposit (plural, **calculi**). These stones vary in size from small sand like granules to the size of marbles and are named for the organ or tissue where they are located. Urinary stones are usually formed when waste products in the urine crystallize.
- **Nephrolithiasis** (**nef**-roh-lih-**THIGH**-ah-sis) is a disorder characterized by the presence of stones in the kidney (**nephr/o** means kidney and -**lithiasis** means the presence of stones).

The Urinary Bladder

- **Cystitis** (sis-**TYE**-tis) is an inflammation of the bladder (**cyst** mean bladder and -**itis** means inflammation).

- **Urinary tract infections** (**UTIs**) usually begin in the bladder. These infections occur more frequently in women because of the shortness of the urethra and the proximity of its opening to the vagina and rectum.

Incontinence

- **Incontinence** (in-**KON**-tih-nents) means the inability to control excretory functions.

Treatment Procedures of the Urinary System

Medications

- **Diuretics** (**dye**-you-**RET**-icks) are medications administered to increase urine secretion to rid the body of excess sodium and water.

Dialysis

- **Dialysis** (dye-**AL**-ih-sis) is a procedure to remove waste products from the blood of patients whose kidneys no longer function (**dia-** means complete or through and **-lysis** means separation). The two types of dialysis in common use are hemodialysis and peritoneal dialysis.

Removal of Kidney Stones

- **Lithotripsy** (**LITH-**oh-**trip**-see), also known as **extra corporeal shockwave lithotripsy**, is the destruction of a kidney, urinary, or bladder stone with the use of high-energy ultrasonic waves traveling through water or gel (**lith/o** means stone and **-tripsy** means to crush). The fragments of the stones are then excreted in the urine. *Extracorporeal* means situated or occurring outside the body.

The Urinary Bladder

- A **cystectomy** (sis-**TECK**-toh-mee) is the surgical removal of all or part of the urinary bladder (**cyst** means bladder and **-ectomy** means surgical removal).

Catheterization

Catheterization is performed to withdraw urine for diagnostic purposes, to control incontinence, or to place fluid, such as a chemotherapy solution, into the bladder.

Challenge Word Building
These terms are not found in this chapter; however, they are made up of the following familiar word parts. You may want to look in the textbook glossary or use a medical dictionary to check your answers.

cyst/o	**-cele**
nephr/o	**-itis**
pyel/o	**-lysis**
ureter/o	**-malacia**
urethra/o	**-ostomy**
	-otomy
	-plasty
	-ptosis
	-rrhexis
	-sclerosis

7.1. The creation of an artificial opening between the urinary bladder the exterior of the body is a/an _____.

7.2. A surgical incision into the kidney is a/an _____.

7.3. The term meaning abnormal hardening of the kidney is _____.

7.4. The term meaning prolapse of the bladder into the urethra is _____.

7.5. A hernia in the urethral wall is a/an _____.

7.6. The procedure to separate adhesions around a ureter is _____.

7.7. The term meaning abnormal softening of the kidney is _____.

7.8. The term meaning an inflammation of the renal pelvis and kidney is _____.

7.9. The term meaning rupture of the bladder is _____.

7.10. The term meaning surgical repair of the bladder is _____.

Medical Terminology for Medical Assistants
Part VIII: The Digestive System

Structures, Combining Forms, and Functions of the Digestive System

Major Structures	Related Combining Forms	Primary Functions
Mouth	or/o, stomat/o	Begins preparation of food for digestion.
Pharynx	pharyng/o	Transports food from the mouth to the esophagus.
Esophagus	esophag/o	Transports food from the pharynx to the stomach.
Stomach	gastr/o	Breaks down food and mixes it with digestive juices.
Small Intestine	enter/o	Completes digestion and absorption of most nutrients.
Large Intestine	col/o, colon/o	Absorbs excess water and prepares solid waste for elimination.
Rectum and Anus	an/o, proct/o, rect/o	Control the excretion of solid waste.
Liver	hepat/o	Secretes bile and enzymes to aid in the digestion of fats.
Gallbladder	cholecyst/o	Stores bile and releases it to the small intestine as needed.
Pancreas	pancreat/o	Secretes digestive juices and enzymes into small intestine as needed.

Functions of the Digestive System

The digestive system is also known as the **alimentary canal** (**al**-ih-**MEN**-tar-ee) (**aliment** means to nourish and -**ary** means pertaining to). The digestive system is responsible for:

- The intake and digestion of food.
- The absorption of nutrients from digested food.
- The elimination of solid waste products.

The Gastrointestinal Tract

The structures of the digestive system are also described as the **gastrointestinal** (**gas**-troh-in-**TESS**- tih-nal) or **GI tract** (**gastr/o** means stomach, **intestin** means intestine, and -**al** means pertaining to).

- The **upper GI tract** consists of the mouth, esophagus, and stomach.
- The **lower GI tract** is made up of the small intestine, large intestines, rectum, and anus. The intestines are sometimes referred to as the **bowels**.
- When these terms are used to describe diagnostic procedures, the small intestine is usually included with the upper GI tract.

The Lips

- The **lips**, also known as **labia** (**LAY**-bee-ah), form the opening to the oral cavity (singular, **labium**). (The term *labia*, is also applied to part of the female genitalia.) Another word part relating to the lips of the mouth is **cheil/o**.

The Palate

- The **palate** (**PAL**-at), which forms the roof of the mouth, consists of two parts: the hard and soft palates.
- The **hard palate** forms the bony anterior portion of the palate that is covered with specialized mucous membrane.
- **Rugae** (**ROO**-gay), which are irregular ridges or folds in the mucous membrane, cover the anterior portion of the hard palate. Rugae are also found in the stomach (singular, **ruga**).
- The **soft palate** forms the flexible posterior portion of the palate. It has the important role of closing off the nasal passage during swallowing so food and liquid do not move upward into the nasal cavity.
- The **uvula** (**YOU**-view-lah), which hangs from the free edge of the soft palate, moves upward with the soft palate during swallowing. Enlargement of the uvula is often associated with snoring problems.

Terms Related to the Teeth

- The term **dentition** (den-**TISH**-un) refers to the natural teeth arranged in the **maxillary** (upper) and **mandibular** (lower) arches.
- **Edentulous** (ee-**DEN**-too-lus) means without teeth. This term is used after the natural teeth have been lost.

The Periodontium

- The **periodontium** (**pehr**-ee-oh-**DON**-shee-um) consists of the bone and soft tissues that surround and support the teeth (**peri-** means surrounding, **odonti** means the teeth, and **-um** is the noun ending).
- The **gingiva** (**JIN**-jih-vah), also known as the **gums**, is the specialized mucous membrane that surrounds the teeth, covers the bone of the dental arches, and continues to form the lining of the cheeks.

The Salivary Glands

- The **salivary glands** (**SAL**-ih-ver-ee) secrete saliva that moistens food, begins the digestive process, and cleanses the mouth.

The Pharynx

- The **pharynx** (**FAR**-inks), also known as the **throat**, is the common passageway for both respiration and digestion.

The Esophagus

- The **esophagus** (eh-**SOF**-ah-gus), also known as the **gullet**, is a collapsible tube that leads from the pharynx to the stomach.

The Small Intestine

- The **small intestine** extends from the pyloric sphincter to the first part of the large intestine. It is here that the nutrients from food are absorbed into the bloodstream. The small intestine is a coiled organ up to 20 feet in length; however, it is known as the small intestine because it is smaller in diameter than the large intestine.

The Large Intestine

- The **large intestine** extends from the end of the small intestine to the anus. It is about twice as wide as the small intestine but only about one-fourth as long. It is here that the waste products of digestion are processed in preparation for excretion through the anus. The major parts of the large intestine are the cecum, colon, rectum, and anus.

The Gallbladder

- The **gallbladder** is a pear-shaped organ about the size of an egg located under the liver. It stores and concentrates the bile for later use.
- The term **cholecystic** (**koh**-lee-**SIS**-tick) means pertaining to the gallbladder (**cholecyst** means gallbladder and **-ic** means pertaining to).

The Pancreas

- The **pancreas** (**PAN**-kree-as) is a large feather-shaped organ located posterior to (behind) the stomach. It has important roles in both the digestive and endocrine systems.

Metabolism

- **Metabolism** (meh-**TAB**-oh-lizm) is the sum of anabolism and catabolism; that is, metabolism includes all of the processes involved in the body's use of nutrients (**metabol** means change and **-ism** means condition).

- **Anabolism** (an-**NAB**-oh-lizm) is the building up of body cells and substances from nutrients.
- **Catabolism** (kah-**TAB**-oh-lizm), which is the opposite of anabolism, is the breaking down of body cells or substances, releasing energy and carbon dioxide.

The Role of the Mouth, Salivary Glands, and Esophagus

- **Mastication** (mass-tih-**KAY**-shun), also known as **chewing,** breaks food down into smaller pieces and mixes it with saliva. Saliva contains an enzyme that begins the chemical breakdown to convert starches into sugar.

The Esophagus

- **Dysphagia** (dis-**FAY**-jee-ah) is difficulty in swallowing (**dys**- means difficult and -**phagia** means swallowing).
- A **hiatal hernia** (high-**AY**-tal **HER**-nee-ah) is a protrusion of part of the stomach through the esophageal sphincter in the diaphragm (**hiat** means opening and -**al** means pertaining to). A *hernia* is the protrusion of a part or structure through the tissues that normally contain it.

The Stomach

- **Gastritis** (gas-**TRY**-tis) is a common inflammation of the stomach lining often caused by the bacterium *Helicobacter pylori* (**gastr** means stomach and -**itis** means inflammation).

Peptic Ulcers

- **Peptic ulcers** (**UL**-serz) affect the mucous membranes of the digestive system (**pept** means digestion and -**ic** means pertaining to). Peptic ulcers can occur in the lower end of the esophagus, the stomach, or in the duodenum. An *ulcer* is an erosion of the skin or mucous membrane that is frequently caused by the bacterium *Helicobacter pylori*.

Eating Disorders

- **Anorexia nervosa** (**an**-oh-**RECK**-see-ah) is an eating disorder characterized by a false perception of body appearance. This leads to an intense fear of gaining weight and refusal to maintain a normal body weight. Compulsive dieting and excessive exercising often cause the patient to become emaciated.
- **Emaciated** (ee-**MAY**-shee-ayt-ed) means abnormally thin.
- **Bulimia nervosa** (byou-**LIM**-ee-ah *or* boo-**LEE**- mee-ah), also known as **bulimia**, is an eating disorder characterized by a false perception of body appearance leading to frequent episodes of binge eating followed by compensatory behaviors such as self-induced vomiting or the misuse of laxatives, diuretics, or other medications. *Bulimia* means continuous, excessive hunger.

Obesity

- **Obesity** (oh-**BEE**-sih-tee) is an excessive accumulation of fat in the body. The term obese is usually used to refer to individuals who are more than 20 percent to 30 percent over the established weight standards for their height, age, and sex.

Indigestion and Vomiting

- **Dyspepsia** (dis-**PEP**-see-ah), also known as indigestion, is pain or discomfort in digestion (**dys**- means painful and -**pepsia** means digestion).
- **Hematemesis** (**hee**-mah-**TEM**-eh-sis *or* **hem**-ah- **TEM**-eh-sis) is the vomiting of blood (**hemat** means blood and -**emesis** means vomiting).

Intestinal Disorders

- **Diverticulitis** (**dye**-ver-tick-you-**LYE**-tis) is the inflammation of one or more diverticula in the colon (**diverticul** means diverticulum and -**itis** means inflammation). Compare with *diverticulosis*.

The Liver

- **Hepatomegaly** (**hep**-ah-toh-**MEG**-ah-lee) is the abnormal enlargement of the liver (**hepat/o** means liver and -**megaly** means enlargement).
- **Jaundice** (**JAWN**-dis), also known as **icterus** (**ICK**-ter-us), is a yellow discoloration of the skin and eyes caused by greater-than-normal amounts of bilirubin in the blood.

Hepatitis

- **Hepatitis** (**hep**-ah-**TYE**-tis) is an inflammation of the liver (**hepat** means liver and -**itis** means inflammation).

Cirrhosis

- **Cirrhosis** (sih-**ROH**-sis) is a progressive degenerative disease of the liver in which scar tissue replaces normal tissue (**cirrh** means yellow or orange and -**osis** means abnormal condition).

Diagnostic Procedures of the Digestive System

- **Anoscopy** (ah-**NOS**-koh-pee) is the visual examination of the anal canal and lower rectum (**an/o** means anus and -**scopy** means visual examination).
- An **upper GI series**, or **barium swallow**, and **lower GI series**, or **barium enema**, are radiographic studies to examine the digestive system.
- The term **enema** describes a solution placed into the rectum and colon to empty the lower intestine through bowel activity. One purpose of an enema is to clear the bowels in preparation for an endoscopic examination.
- **Hemoccult** (**HEE**-moh-kult), also known as the **fecal occult blood test**, is a laboratory test for hidden blood in the stools (**hem** means blood and -**occult** means hidden).

Endoscopic Procedures

- An **endoscope** is an instrument used for visual examination of internal structures (**endo**- means within and -**scope** means an instrument for visual examination). Endoscopes are also used for obtaining biopsy samples, controlling bleeding, removing foreign objects, as well as for other surgical and treatment procedures. The endoscopes and procedures are named for the body parts being examined or treated.

- **Colonoscopy** (**koh**-lun-**OSS**-koh-pee) is the direct visual examination of the inner surface of the colon from the rectum to the cecum (**colon/o** means colon and **-scopy** means visual examination).
- **Sigmoidoscopy** (**sig**-moi-**DOS**-koh-pee) is the endoscopic examination of the interior of the rectum, sigmoid colon, and possibly a portion of the descending colon (**sigmoid/o** means sigmoid colon and **-scopy** is the visual examination).

Challenge Word Building
These terms are not found in this chapter; however, they are made up of the following familiar word parts. You may want to look in the textbook glossary or use a medical dictionary to check your answers.

col/o	**-algia**
enter/o	**-ectomy**
esophag/o	**-itis**
gastr/o	**-megaly**
hepat/o	**-ic**
proct/o	**-pexy**
sigmoid/o	**-rrhaphy**

8.1. The term meaning the surgical suturing of a stomach wound is _____.

8.2. The term meaning pain in the esophagus is _____.

8.3. The term meaning the surgical removal of all or part of the sigmoid colon is _____.

8.4. The term meaning pain in and around the anus and rectum is _____.

8.5. The term meaning the surgical fixation of the stomach to correct displacement is _____.

8.6. The term meaning inflammation of the sigmoid colon is _____.

8.7. The term meaning the surgical removal of all or part of the esophagus and stomach is _____.

8.8. The term referring to the liver and intestines is _____.

8.9. The term meaning abnormal enlargement of the liver is _____.

8.10. The term meaning inflammation of the stomach, small intestine, and large intestine is _____.

Medical Terminology for Medical Assistants
Part IX: The Nervous System

Overview of Structures, Combining Forms, and Functions of the Nervous System

Major Structures	Related Combining Forms	Primary Functions
Brain	encephal/o	Coordinates all activities of the body by receiving and transmitting messages throughout the body.
Spinal Cord	myel/o	Transmits nerve impulses between the brain, limbs, and lower part of the body.
Nerves	neur/i, neur/o	Receive and transmit messages to and from all parts of the body.

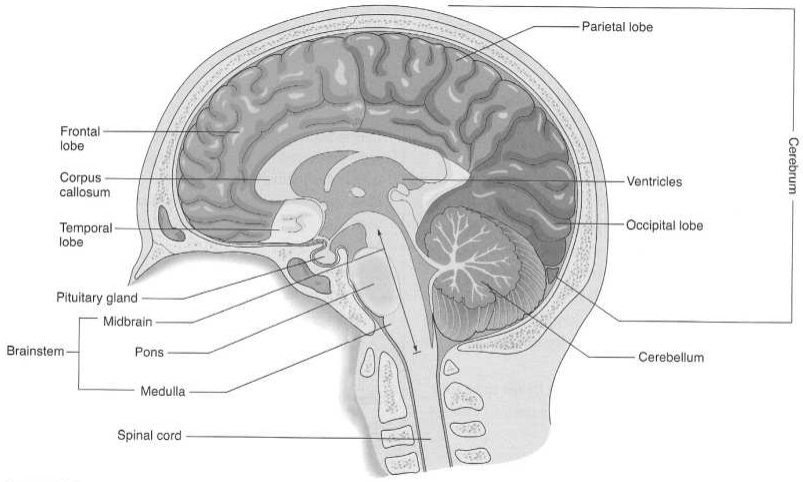

FIGURE 10.5 A cross section showing the major parts of the brain.

The Cerebrum

The **cerebrum** (seh-**REE**-brum) is the largest and uppermost portion of the brain. It is responsible for all thought, judgment, memory, and emotion, as well as for controlling and integrating motor and sensory functions. Note that *cerebrum* and *cerebellum* are similar words, but refer to different parts of the brain. *Memory aid*: The *cerebel*lum is *below* the cerebrum.

- The term **cerebral** (**SER**-eh-bral *or* seh-**REE**-bral) means pertaining to the cerebrum or to the brain.
- The **cerebral cortex**, which is made up of gray matter, is the outer layer of the cerebrum and is arranged in deep folds known as fissures. As used here, a *fissure* is a normally occurring deep groove. Fissures are also crack-like sores in the skin.

The Cerebral Hemispheres

- The cerebrum is divided into the **left** and **right** hemispheres, which are also referred to as the left brain and right brain.
- The two cerebral hemispheres are connected at the lower midpoint by the **corpus callosum** (**KOR**-pus kah-**LOH**-sum).

The Lobes of the Cerebrum

Each hemisphere of the cerebrum is divided into four lobes, and each lobe is named for the bone of the cranium that covers it.

- The **frontal lobe** controls skilled motor functions, memory, and behavior.
- The **parietal lobe** receives and interprets nerve impulses from sensory receptors in the tongue, skin, and muscles.
- The **occipital lobe** controls eyesight.
- The **temporal lobe** controls the senses of hearing and smell, and the ability to create, store, access new information.

The Thalamus

- The **thalamus** (**THAL**-ah-mus), which is located below the cerebrum, produces sensations by relaying impulses to and from the cerebrum and the sense organs of the body. *Note*: Be careful not confuse the *thalamus* with the *thymus*, which is part of the endocrine system.

The Hypothalamus

The **hypothalamus** (**high**-poh-**THAL**-ah-mus), which is below the thalamus, has seven major regulatory functions.

- Regulates and integrates the autonomic nervous system, thereby controlling heart rate, blood pressure, respiratory rate, and digestive tract activity.
- Regulates emotional responses, including fear and pleasure.
- Regulates body temperature.
- Regulates food intake by controlling hunger sensations.
- Regulates water balance and thirst.
- Regulates sleep-wakefulness cycles.
- Regulates the pituitary gland and endocrine system activity.

The Cerebellum

- The **cerebellum** (**ser**-eh-**BELL**-um) is the second-largest part of the brain. It is located at the back of the head below the posterior part of the cerebrum.

The Brainstem

- The **brainstem** is the stalk-like portion of the brain that connects the cerebral hemispheres with the **spinal cord**. It is made up of three parts: the midbrain, pons, and medulla.

The Midbrain and Pons

- The **midbrain** and **pons** (**PONZ**) provide conduction pathways to and from higher and lower centers in the brain.

The Medulla

- The **medulla** (meh-**DULL**-ah), also known as the **medulla oblongata** (meh-**DULL**-ah **ob**-long-**GAH**-tah), is located at the lowest part of the brainstem and is connected to the spinal cord. It controls basic life functions including the muscles of respiration, heart rate, and blood pressure, as well as reflexes for coughing, sneezing, swallowing, and vomiting.

The Spinal Cord

- The spinal cord is the pathway for impulses going to and from the brain.
- The spinal cord contains all the nerves that affect the limbs and lower part of the body.
- The spinal cord is protected by CSF and is surrounded by the three meninges.
- The gray matter in the spinal cord, which is not protected by a myelin sheath, is located in the internal section. The myelinated white matter composes the outer portion of the spinal cord.

Disorders of the Brain

- **Alzheimer's disease** (**ALTZ**-high-merz) is a group of disorders associated with degenerative changes in the brain structure that lead to symptoms including progressive memory loss, impaired cognition, and personality changes.
- **Cognition** (kog-**NISH**-un) is the mental activities associated with thinking, learning, and memory.
- **Encephalitis** (**en**-sef-ah-**LYE**-tis) is an inflammation of the brain (**encephal** means brain and -**itis** means inflammation). Compare with **meningitis**.
- **Parkinson's disease** is a chronic, degenerative CNS disorder in which there is a gradually progressive loss of control over movement.
- **Tetanus** (**TET**-ah-nus), also known as **lockjaw**, is an acute and potentially fatal infection of the CNS caused by a toxin produced by the tetanus bacteria, typically acquired through a deep wound. Tetanus can be prevented through immunization.

The Spinal Cord

- **Myelitis** (**my**-eh-**LYE**-tis) is an inflammation of the spinal cord (**myel** means spinal cord and bone marrow and -**itis** means inflammation). Myelitis also means inflammation of bone marrow.
- A **myelosis** (**my**-eh-**LOH**-sis) is a tumor of the spinal cord (**myel** means spinal cord and bone marrow and -**osis** means abnormal condition). Myelosis also means an abnormal proliferation of bone marrow tissue.
- **Poliomyelitis** (**poh**-lee-oh-**my**-eh-**LYE**-lis), also known as **polio**, is a highly contagious viral infection that in its acute form can inflame the spinal cord and brainstem, sometimes resulting in paralysis (**poli/o** means gray, **myel** means spinal cord, and -**itis** means inflammation).
- **Radiculitis** (rah-**dick**-you-**LYE**-tis), also known as a **pinched nerve**, is an inflammation of the root of a spinal nerve (**radicul** means root or nerve root and -**itis** means inflammation).

Nerves

- **Amyotrophic lateral sclerosis** (ah-**my**-oh-**TROH**-fick), also known as **Lou Gehrig's disease**, is a degenerative disease of the motor nerve cells of the brain and spinal cord in which patients become progressively weaker until they are completely paralyzed.
- **Bell's palsy**, which is the temporary paralysis of the seventh cranial nerve, causes drooping only on the affected side of the face. In addition to one-sided facial paralysis with possible inability to close the eye, symptoms of Bell's palsy may include pain, tearing, drooling, hypersensitivity to sound in the affected ear, and impairment of taste. Compare with *trigeminal neuralgia*.
- **Sciatica** (sigh-**AT**-ih-kah) is inflammation of the sciatic nerve that results in pain, burning, and tingling along the course of this nerve through the thigh and leg.

Cerebral Palsy

- **Cerebral palsy** (**SER**-eh-bral or seh-**REE**-bral **PAWL**- zee) is a condition characterized by poor muscle control, spasticity, speech defects, and other neurologic deficiencies due to damage that affects the cerebrum. (Cerebral means pertaining to the head or brain and palsy means paralysis.)

Epilepsy and Seizures

- **Epilepsy** (**EP**-ih-**lep**-see) is a group of neurologic disorders characterized by recurrent episodes of seizures. The terms **seizure** (**SEE**-zhur) and convulsion are used interchangeably. These electrical disturbances in the brain may be caused by extreme high fever, brain injury, or brain lesions.

Diagnostic Procedures of the Nervous System

- **Magnetic resonance imaging(MRI)** and **computerized tomography (CT)** are important neuroimaging tools because they facilitate the examination of the soft tissue structures of the brain and spinal cord.
- **Myelography** (**my**-eh-**LOG**-rah-fee) is a radiographic study of the spinal cord after the injection of a contrast medium through a lumbar puncture (**myel/o** means spinal cord and **-graphy** means the process of producing a picture or record).
- Lumbar puncture, also known as a spinal tap, is sampling of cerebrospinal fluid obtained by inserting a needle into the subarachnoid space of the lumbar region.

Phobias

- A **phobia** (**FOH**-bee-ah) is a persistent irrational fear of a specific thing or situation strong enough to cause significant distress and/or interfere with functioning. This fear causes predictable anxiety when facing the thing or situation, often leading to avoidance. There are countless types of phobias; they are named by adding **-phobia** to the name of the object, for example, a fear of spiders is *arachnophobia* (**arachn/o** means spider and **-phobia** means abnormal fear).

Abbreviations Related to the Nervous System

aphasia = Aph	**Aph** = aphasia
attention deficit disorder = ADD	**ADD** = attention deficit disorder
Bell's palsy = BP	**BP** = Bell's palsy
cerebral palsy = CP	**CP** = cerebral palsy
delirium tremens = DT, DT's, DTs	**DT, DT's, DTs** = delirium tremens
encephalitis = E	**E** = encephalitis
epilepsy = epi, epil	**epi, epil** = epilepsy
Guillain-Barré syndrome = GBS	**GBS** = Guillain-Barré syndrome
meningitis = men, mgtis	**men, mgtis** = meningitis
multiple sclerosis = MS	**MS** = multiple sclerosis
obsessive-compulsive disorder = OCD	**OCD** = obsessive-compulsive disorder
posttraumatic stress disorder = PTSD	**PTSD** = posttraumatic stress disorder
tetanus = TE	**TE** = tetanus
transcutaneous electronic nerve stimulation = TENS	**TENS** = transcutaneous electronic nerve stimulation

Matching Word Parts 1
Write the correct answer in the middle column.

	Definition	Correct Answer	Possible Answers
9.1	brain	_____	ambul/o
9.2	bruise	_____	concuss/o
9.3	shaken together	_____	contus/o
9.4	sound	_____	ech/o
9.5	to walk	_____	encephal/o

Matching Word Parts 2
Write the correct answer in the middle column.

	Definition	Correct Answer	Possible Answers
9.6	brain covering	_____	-esthesia
9.7	sensation, feeling	_____	cephal/o
9.8	spinal cord	_____	klept/o
9.9	to steal	_____	mening/o
9.10	head	_____	myel/o

Matching Word Parts 3
Write the correct answer in the middle column.

	Definition	Correct Answer	Possible Answers
9.11	abnormal fear	_____	narc/o
9.12	mind	_____	neur/o
9.13	nerve	_____	-phobia
9.14	sleep	_____	psych/o
9.15	stupor	_____	somn/o

Matching Structures
Write the correct answer in the middle column.

	Definition	Correct Answer	Possible Answers
9.16	connects the brain and spinal cord	_____	cerebellum
9.17	uppermost layer of the brain	_____	cerebrum
9.18	most protected brain part	_____	hypothalamus
9.19	coordinates muscular activity	_____	medulla
9.20	controls vital body functions	_____	brainstem

Medical Terminology for Medical Assistants
Part X: Special Senses: The Eyes and Ears

Overview of Structures, Combining Forms, and Functions of the Eyes and Ears

Major Structures	Related Combining Forms	Primary Functions
Eyes (and Vision)	opt/i, opt/o, optic/o, ophthalm/o	Receptor organs for the sense of sight.
Adnexa of the Eye		Accessory structures that provide protection and movement for the eyes.
Lacrimal Apparatus	dacryocyst/o, lacrim/o	Produces, stores, and removes tears.
Iris	ir/i, ir/o, irid/o, irit/o	Controls the amount of light entering the eye.
Lens	phac/o, phak/o	Focuses rays of light on the retina.
Retina	retin/o	Converts light images into electrical impulses and transmits them to the brain.
Ears (Hearing and Sound)	acous/o, acoust/o, audi/o, audit/o, ot/o	Receptor organs for the sense of hearing; also help to maintain balance.
Outer Ear	pinn/i	Transmits sound waves to the middle ear.
Middle Ear	myring/o, tympan/o	Transmits sound waves to the inner ear.
Inner Ear	labyrinth/o	Receives sound vibrations and transmits them to the brain.

Functions of the Eyes

The eyes are the receptor organs of sight. The following abbreviations are used to describe them. The letter O stands for Oculus, the Latin word for eye. The functions of the eyes are to receive images and transmit them to the brain.

Abbreviations Relating to the Eyes

OD	Right eye
OS	Left eye
OU	Each eye (or both eyes)

The Sclera and Cornea

- The **sclera** (**SKLEHR**-ah), also known as the **white of the eye**, is the rough, fibrous tissue that forms the outer layer of the eye, except for the part covered by the cornea. It maintains the shape of the eye and protects the delicate inner layers of tissue. *Caution*: **scler/o** means the white of the eye; it also means hard.
- The **cornea** (**KOR**-nee-ah) is the transparent outer surface of the eye covering the iris and pupil. It is the primary structure focusing light rays entering the eye.

The Retina

- The **retina** (**RET**-ih-nah) is the sensitive innermost layer that lines the posterior segment of the eye.
- The retina contains specialized light-sensitive cells called **rods** (black and white receptors) and **cones** (color receptors).

Visual Acuity

- **Visual acuity** is the ability to distinguish object details and shape at a distance. *Acuity* means sharpness.
- A **Snellen chart** is used to measure visual acuity. The results for each eye are recorded as two numbers in fraction form.
- The first number indicates the distance from the chart, which is always standardized at 20 feet. The second number indicates the deviation from the norm based on the ability to read progressively smaller lines of letters on the chart.
- For example, a person with 20/40 vision can read at 20 feet what someone with "normal" vision could read from a distance of 40 feet. Although normal vision has been standardized at 20/20, many people have vision of 20/15 or better.

Medical Specialties Related to the Eyes

- An **ophthalmologist** (ahf-thal-**MOL**-oh-jist) holds an MD degree and specializes in diagnosing and treating diseases and disorders of the eyes and vision (**ophthalm** means eye and -**ologist** means specialist).
- An **optometrist** (op-**TOM**-eh-trist) holds a Doctor of Optometry degree and specializes in measuring the accuracy of vision to determine whether corrective lenses are needed (**opt/o** means vision and -**metrist** means one who measures).

Additional Adnexa Pathology

- **Conjunctivitis** (kon-**junk**-tih-**VYE**-tis), also known as **pinkeye**, is an inflammation of the conjunctiva, usually caused by an infection or allergy (**conjunctiv** means conjunctiva and -**itis** means inflammation).
- **Subconjunctival hemorrhage** is bleeding between the conjunctiva and the sclera. This common condition, usually caused by an injury, causes a red area over the white of the eye.
- **Xerophthalmia** (**zeer**-ahf-**THAL**-mee-ah), also known as dry eye, is drying of eye surfaces, including the conjunctiva, that may be due to disease or to a lack of vitamin A in the diet (**xer**- means dry, **ophthalm** means eye, and -**ia** means abnormal condition).

Sclera, Cornea, and Iris

- **Scleritis** (skleh-**RYE**-tis) is an inflammation of the sclera (**sclera** means white of eye and **-itis** means inflammation). *Note*: **scler/o** also means hard.

Glaucoma

- **Glaucoma** (glaw-**KOH**-mah) is a group of diseases characterized by increased intraocular pressure (IOP), resulting in damage to the retinal nerve fibers and the optic nerve.

Refractive Disorders

- **Astigmatism** (ah-**STIG**-mah-tizm) is a condition in which the eye does not focus properly because of uneven curvatures of the cornea.
- **Hyperopia** (**high**-per-**OH**-pee-ah], also known as **farsightedness**, (**far-** means you see far), is a defect in which light rays focus beyond the retina (**hyper-** means excessive and **-opia** means vision condition). This condition may occur in childhood, but usually causes difficulty after age 40. Compare with *myopia*.
- **Myopia** (my-**OH**-pee-ah) (**MY**), also known as **nearsightedness**, (**near-** means you see near), is a defect in which light rays focus in front of the retina. This condition occurs most commonly around puberty. Compare with *hyperopia*.

Cataract Surgery

- **Lensectomy** (len-**SECK**-toh-mee) is the general term used to describe the surgical removal of a cataract-clouded lens (**lens** means lens and **-ectomy** means surgical removal).

Corrective Lenses

- Refractive errors in the eye can often be corrected with lenses that alter the angle of light rays before they reach the cornea. *Concave lenses* (curved inward) are used for myopia, or nearsightedness, and *convex* lenses (curved outward) for hyperopia, or farsightedness.

Functions of the Ears

- The ears are the receptor organs of hearing. The following abbreviations are used to describe them.

AD	Right ear
AS	Left ear
AU	Each ear (or both eyes)

The letter A stands for *auris*, the Latin word for ear. The functions of the ears are to receive sound impulses and transmit them to the brain. The inner ear also helps to maintain balance.

- The term **auditory** (**AW**-dih-**tor**-ee) means pertaining to the sense of hearing (**audit** means hearing or sense of hearing and **-ory** means pertaining to).

- **Acoustic** (ah-**KOOS**-tick) means relating to sound or hearing (**acous** means hearing or sound and **-tic** means pertaining to).

Structures of the Ears

- The ear is divided into three separate regions: the outer ear, the middle ear, and the inner ear.

The Outer Ear

- The **pinna** (**PIN**-nah), also known as the **auricle**, is the external portion of the ear. This structure catches sound waves and transmits them into the external auditory canal.
- The **external auditory canal** transmits sound waves from the pinna to the middle ear.
- **Cerumen** (seh-**ROO**-men), also known as **earwax**, is secreted by ceruminous glands that line the auditory canal. This sticky yellow-brown substance has protective functions as it traps small insects, dust, debris, and certain bacteria to prevent them from entering the middle ear.

The Middle Ear

- The **tympanic membrane** (tim-**PAN**-ick), also known as the **eardrum**, is located between the outer and middle ear. (**myring/o** and **tympan/o** both mean tympanic membrane.) The eardrum seals the inner end of the ear canal.

The Inner Ear

- The **inner ear**, also known as the **labyrinth** (**LAB**-ih- rinth), contains the sensory receptors for hearing and balance.

Abbreviations Related to the Special Senses

age-related macular degeneration = AMC	**AMC** = age-related macular degeneration
astigmatism = AS	**AS** = astigmatism
cataract = CAT	**CAT** = cataract
conjunctivitis = CI	**CI** = conjunctivitis
glaucoma = G, glau, glc	**G, glau, glc** = glaucoma
hertz = Hz	**Hz** = hertz
hyperopia = H	**H** = hyperopia
intraocular lens = IOL	**IOL** = intraocular lens
myopia = M, MY, Myop	**M, MY, Myop** = myopia

retinal detachment = RD	**RD** = retinal detachment
Snellen chart = SC	**SC** = Snellen chart
tympanic membrane = TM	**TM** = tympanic membrane
visual acuity = V, VA	**V, VA** = visual acuity

Matching Word Parts 1
Write the correct answer in the middle column.

	Definition	Correct Answer	Possible Answers
10.1	cornea, hard	_____	blephar/o
10.2	to measure	_____	-cusis
10.3	eyelid	_____	kerat/o
10.4	hearing	_____	opt/o
10.5	eyes, vision	_____	-metry

Matching Word Parts 2
Write the correct answer in the middle column.

	Definition	Correct Answer	Possible Answers
10.6	eye, vision	_____	myring/o
10.7	eardrum	_____	irid/o
10.8	iris of the eye	_____	-opia
10.9	old age	_____	ophthalm/o
10.10	vision condition	_____	presby

Matching Word Parts 3
Write the correct answer in the middle column.

	Definition	Correct Answer	Possible Answers

10.11	retina	_____	ot/o
10.12	hard, white of eye	_____	retin/o
10.13	turn	_____	sclera/o
10.14	ear	_____	tympan/o
10.15	eardrum	_____	trop/o

Matching Conditions
Write the correct answer in the middle column.

	Definition	Correct Answer	Possible Answers
10.16	squint	_____	diplopia
10.17	nearsightedness	_____	esotropia
10.18	farsightedness	_____	hyperopia
10.19	double vision	_____	myopia
10.20	cross-eyes	_____	strabismus

Challenge Word Building
These terms are not found in this chapter; however, they are made up of the following familiar word parts. You may want to look in the textbook glossary or use a medical dictionary to check your answers.

blephar/o	-algia
irid/o	-ectomy
lacrim/o	-edema
ophthalm/o	-itis
labrynth/o	-ology
retin/o	-otomy
	-pathy

10.21 The term meaning pain felt in the iris is _____.

10.22. The term meaning inflammation of the eyelid is _____.

10.23. The term meaning an incision into the iris is a/an _____.

10.24. The term meaning any disease of the retina is _____.

10.25. The term meaning the study of the eye is _____.

10.26. The term meaning swelling of the eyelid is _____.

10.27. The term meaning a surgical incision into the lacrimal duct is a/an _____.

10.28. The term meaning the surgical removal of the labyrinth of the inner ear is a/an _____.

10.29. The term meaning any disease of the iris is _____.

11.30. The term meaning inflammation of the retina is _____.

Medical Terminology for Medical Assistants
Part XI: The Skeletal System

Overview of Structures, Combining Forms, and Functions of the Skeletal System

Major Structures	Related Combining Forms	Primary Functions
Bones	oss/e, oss/i, oste/o, ost/o	Act as the framework for the body, protect the internal organs, and store the mineral calcium.
Bone Marrow	myel/o (also means spinal cord)	Red bone marrow forms some blood cells. Yellow bone marrow stores fat.
Cartilage	chondr/o	Creates a smooth surface for motion within the joints and protects the ends of the bones.
Joints	arthr/o	Work with the muscles to make a variety of motions possible.
Ligaments	ligament/o	Connect one bone to another.
Synovial Membrane	synovi/o, synov/o	Forms the lining of synovial joints and secretes synovial fluid.
Synovial Fluid	synovi/o, synov/o	Lubricant that makes smooth joint movements possible.
Bursa	burs/o	Cushions areas subject to friction during movement.

Ligaments

- A **ligament** (**LIG-**ah-ment) is a band of fibrous connective tissue that connects one bone to another bone.
- Be careful not to confuse ligaments and tendons. **Tendons** attach muscles to bones.

Bones of the Skull

- There are 28 bones in the skull including the cranium, auditory ossicles and facial bones. The **cranium** (**KRAY**-nee-um) is the portion of the skull that encloses the brain (**crani** means skull and **-um** is a noun ending). The cranium is made up of eight bones. The only movable bone of the skull is the **mandible** (**MAN**-dih-bul), also known as the lower jawbone.

Thoracic Cavity

- The **thoracic cavity** (thoh-**RAS**-ick), which is part of the axial skeleton, is made up of the ribs, sternum, and thoracic vertebrae. Also known as the **rib cage**, this structure protects the heart and lungs.

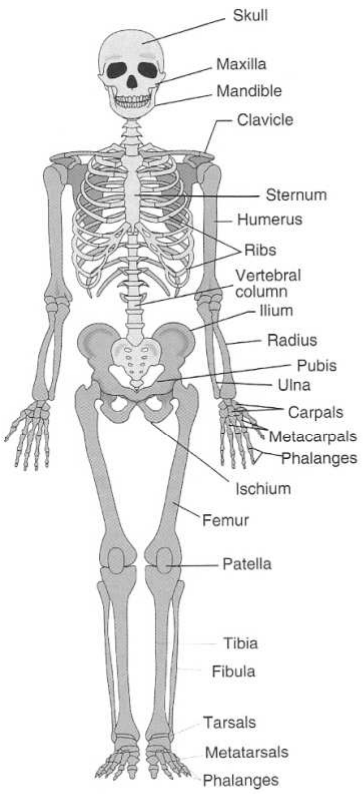

FIGURE 3.7 Anterior view of the adult human skeleton. Bones of the axial skeleton are shown in gray. The bones of the appendicular skeleton are shown in blue.

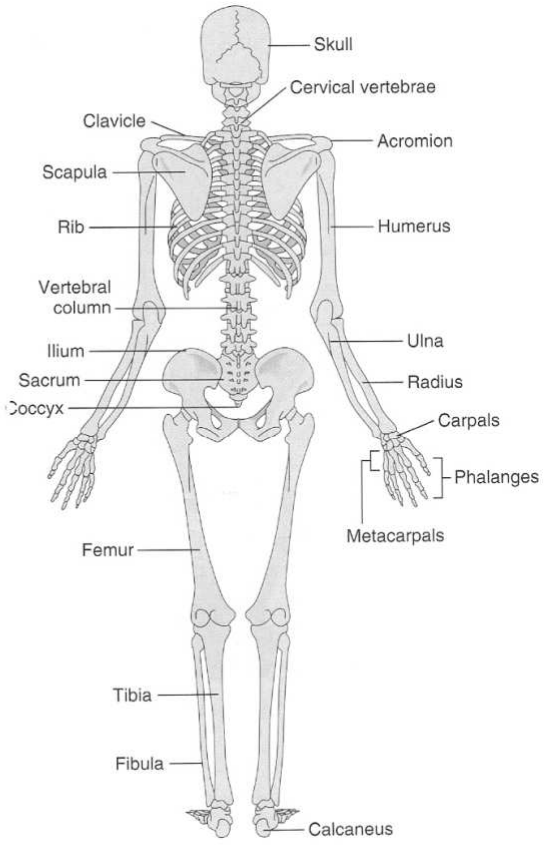

FIGURE 3.8 Posterior view of the adult human skeleton.

Sternum

- The **sternum** (**STER**-num), also known as the **breastbone**, forms the middle of the front of the rib cage.

Shoulders

- The shoulders form the **pectoral girdle** (**PECK**-toh-rahl), which supports the arms and hands; this is also known as the **shoulder girdle**. As used here, the term girdle means a structure that encircles the body.

- The **clavicle** (**KLAV**-ih-kul), also known as the collar bone, is a slender bone that connects the manubrium of the sternum to the scapula.
- The **scapula** (**SKAP**-you-lah) is also known as the **shoulder blade** (plural, **scapulae**).
- The **acromion** (ah-**KROH**-mee-on) is an extension of the scapula that forms the high point of the shoulder.

Arms

- The **humerus** (**HEW**-mer-us) is the bone of the upper arm (plural, **humeri**).
- The **radius** (**RAY**-dee-us) is the smaller bone in the forearm. The radius runs up the thumb side of the forearm.
- The **ulna** (**ULL**-nah) is the larger bone of the forearm. It articulates with the humerus to form the elbow joint.
- The **olecranon process** (oh-**LEK**-rah-non), commonly known as the **funny bone**, is a large projection on the upper end of the ulna that forms the point of the elbow that tingles when struck.

Wrists, Hands, and Fingers

- The 16 **carpals** (**KAR**-palz) are the bones that form the wrists.
- The 10 **metacarpals** (met-ah-**KAR**-palz) are the bones that form the palms of the hands.
- The 28 **phalanges** (fah-**LAN**-jeez) are the bones of the fingers (singular, **phalanx**). The term *phalanges* also describes the bones of the feet.
- Each finger has three bones. These are the **distal** (outermost), **medial** (middle), and **proximal** (nearest the hand) phalanges.
- The thumb has two bones. These are the **distal** and **proximal** phalanges.

Sacrum and Coccyx

- The **sacrum** (**SAY**-krum) is the slightly curved, triangular-shaped bone near the base of the spine that forms the lower portion of the back.
- The **coccyx** (**KOCK**-sicks), also known as the **tailbone**, forms the end of the spine and is made up of four small vertebrae that are fused together.

Femur

- The **femur** (**FEE**-mur) is the upper leg bone. Also known as the **thigh bone**, it is the largest bone in the body.

Knees

- The knees are the complex joints that make possible movement between the upper and lower leg.
- The **patella** (pah-**TEL**-ah) is the bony anterior portion of the kneecap.
- The term **popliteal** (pop-**LIT**-ee-al) refers to the posterior surface of the knee and is used to describe the space, ligaments, vessels, and muscles in this area.
- The **anterior cruciate ligament** (**ACL**) and **posterior cruciate ligament** (**PCL**) make possible the movements of the knee. These are known as **cruciate ligaments** (**KROO**-shee-ayt) because they are shaped like a cross.

Lower Leg

The lower leg is made up of two hones: the tibia and the fibula.

- The **tibia** (**TIB**-ee-ah), also known as the shinbone is the larger weight-bearing bone in the anterior of the lower leg.
- The **fibula** (**FIB**-you-lah) is the smaller of the two bones of the lower leg.

The Ankles

- The **tarsals** (**TAHR**-salz) are the five bones that make up each of the ankles.

The Feet and Toes

- The five **metatarsals** (**met**-ah-**TAHR**-salz) form the part of the foot to which the toes are attached.
- The **phalanges** (fah-**LAN**-jeez) are the bones of the toes (singular, **phalanx**).

Skeletal Pathology

Arthritis

- **Arthritis** (ar-**THRIGH**-tis) is an inflammatory condition of one or more joints (**arthr** means joint and **-itis** means inflammation). There are many different forms and causes of arthritis (plural, **arthritides**).
- **Osteoarthritis** (**oss**-tee-oh-ar-**THRIGH**-tis), also known as **wear-and-tear arthritis**, is most commonly associated with aging (**oste/o** means bone, **arthr** means joint, and **-itis** means inflammation). OA is described as a *degenerative joint disease* (*DJD*) because it is characterized by the erosion of articular cartilage. Erosion means wearing away by friction or pressure.
- **Gouty arthritis** (**GOW**-tee ar-**THRIGH**-tis), also known as **gout**, is a type of arthritis caused by an excess of uric acid in the body. Gout occurs as episodes of sudden, severe attacks of pain and tenderness, redness, warmth, and swelling in the affected joints.

Rheumatoid Arthritis

- **Rheumatoid arthritis** (**ROO**-mah-toyd ar-**THRIGH**-tis) is an autoimmune disorder in which the symptoms are generalized and usually more severe than those of osteoarthritis. In rheumatoid arthritis, the synovial membranes are inflamed and thickened. Other tissues are also attacked, causing the joints to become swollen, painful, and immobile.

Spinal Column

- A **herniated disk** (**HER**-nee-ayt-ed), also known as a **ruptured disk**, is the breaking apart of an intervertebral disk that results in pressure on spinal nerve roots.
- **Lumbago** (lum-**BAY**-goh), also known as **low back** pain, is pain of the lumbar region of the spine (**lumb** means lumbar and **-ago** means diseased condition).

Spina Bifida

- **Spina bifida** (**SPY**-nah **BIF**-ih-dah) is the congenital defect that occurs during early pregnancy in which the spinal canal fails to close around the spinal cord. (*Spina* means pertaining to the spine and *bifida* means split.) Many cases of spina bifida are due to a lack of the nutrient folic acid during the early stages of pregnancy.

Tumors of Bones

- A **myeloma** (**my**-eh-**LOH**-mah) is a malignant tumor composed of blood-forming tissues of the bone marrow (**myel** means bone marrow and **-oma** means tumor). Myeloma may cause pathological fractures, and is often fatal.

Osteoporosis

- **Osteoporosis** (**oss**-tee-oh-poh-**ROH**-sis) is a marked loss of bone density and an increase in bone porosity that is frequently associated with aging (**oste/o** means bone, **por** means small opening, and **-osis** means abnormal condition).

Fractures

- A **fracture**, which is a broken bone, is described in terms of its complexity.
- A **closed fracture**, also known as a **simple** or **complete fracture**, is one in which the bone is broken but there is no open wound in the skin. Compare with an *open fracture*.
- An **open fracture**, also known as a **compound fracture**, is one in which the bone is broken and there is an open wound in the skin. Compare with a *closed fracture*.
- A **greenstick fracture**, or **incomplete fracture**, is one in which the bone is bent and only partially broken. This type of fracture occurs primarily in children.
- An **oblique fracture** occurs at an angle across the bone.

Diagnostic Procedures of the Skeletal System

- **Radiographs**, also known as x-rays, are used to visualize bone fractures and other abnormalities.
- **Arthroscopy** (ar-**THROS**-koh-pee) is the visual examination of the internal structure of a joint (**arthr/o** means joint and **-scopy** means visual examination) using an **arthroscope**.
- A **bone marrow biopsy** is a diagnostic test to determine why blood cells are abnormal or to find a donor match for a bone marrow transplant. This test is performed by inserting a sharp needle into the hipbone or sternum and removing bone marrow cells.
- **Magnetic resonance imaging** (**MRI**) used to image soft tissue structures such as the interior of complex joints. It is not the most effective method of imaging hard tissues such as bone.

Bone Density Testing

- **Bone density testing** is used to determine losses or changes in bone density. These tests are indicated for conditions such as osteoporosis, osteomalacia, and Paget's disease.
- **Ultrasonic bone density testing** is a screening test for osteoposoris or other conditions that cause a loss of bone mass. In this procedure sound waves are used to take measurements of the calcaneus (heel) bone. If the results indicate risks, more definitive testing is indicated.
- **Dual x-ray absorptiometry** (ab-**sorp**-shee-**OM**-eh-tree) produces more definitive results than ultrasonic bone density testing. DXA is a low-exposure radiographic measurement of the spine and hips that is able to detect early signs of osteoporosis.

Bone Marrow Transplants

- A **bone marrow transplant**, also known as a **stem cell transplant**, is used to treat certain types of cancers, such as leukemia and lymphomas, that affect bone marrow.

Joints

- **Arthroscopic surgery** (**ar**-throh-**SKOP**-ick) is a minimally invasive procedure for the treatment of the interior of a joint.

Joint Replacement

- Based on its word parts, the term **arthroplasty** (**AR**-throh-**plas**-tee) means the surgical repair of a damaged joint (**arthr/o** means joint and -**plasty** means surgical repair); however, this term also has come to mean the surgical replacement of a joint with an artificial joint.

Abbreviations Related to the Skeletal System

bone density testing = BDT	**BDT** = bone density testing
bone marrow biopsy = BMB	**BMB** = bone marrow biopsy
bone marrow transplant = BMT	**BMT** = bone marrow transplant
magnetic resonance imaging = MRI	**MRI** = magnetic resonance imaging
osteoarthritis = OA	**OA** = osteoarthritis
osteoporosis = OP	**OP** = osteoporosis
spina bifida = SB	**SB** = spina bifida

Matching Word Parts 1
Write the correct answer in the middle column.

	Definition	Correct Answer	Possible Answers
11.1	hump	_____	ankyl/o
11.2	cartilage	_____	arthr/o
11.3	crooked, bent, or stiff	_____	-um
11.4	joint	_____	kyph/o
11.5	noun ending	_____	Chondr/o

Matching Word Parts 2
Write the correct answer in the middle column.

	Definition	Correct Answer	Possible Answers
11.6	cranium, skull	_____	cost/o
11.7	rib	_____	crani/o
11.8	setting free, loosening	_____	-desis
11.9	spinal cord, bone marrow	_____	-lysis
11.10	surgical fixation of bone or joint	_____	myel/o

Matching Word Parts 3
Write the correct answer in the middle column.

	Definition	Correct Answer	Possible Answers
11.11	vertebra, vertebrae	_____	oste/o
11.12	curved	_____	spondyl/o
11.13	bent backward	_____	lord/o
11.14	synovial membrane	_____	synovi/o, synov/o
11.15	bone	_____	scoli/o

Matching Structures
Write the correct answer in the middle column.

	Definition	Correct Answer	Possible Answers
11.16	breastbone	_____	clavicle
11.17	cheek bones	_____	olecranon
11.18	collar bone	_____	sternum
11.19	kneecap	_____	patella
11.20	point of the elbow	_____	zygomatic

Medical Terminology for Medical Assistants
Part XII: The Endocrine System

Overview Structures, Combining Forms, and Functions of the Endocrine System

Major Structures	Related Combining Forms	Primary Functions
Adrenal Glands (2)	adren/o	Regulate electrolyte levels, influence metabolism, and respond to stress.
Gonads - **Male testicles (2)** - **Female ovaries (2)**	gonad/o	Regulate development and maintenance of secondary sex characteristics
Pancreas (Pancreatic Islets)	pancreat/o	Control blood sugar levels and glucose metabolism.
Parathyroid Glands (4)	parathyroid/o	Regulate calcium levels throughout the body.
Pineal Gland (1)	pineal/o	Influences the sleep wakefulness cycle.
Pituitary Gland (1)	pituit/o, pituitary/o	Secretes hormones that control the activity of the other endocrine glands.
Thymus (1)	thym/o	Plays a major role in the immune reaction.
Thyroid Gland (1)	thyr/o, thyroid/o	Stimulates metabolism, growth, and the activity of the nervous system.

Functions of the Endocrine System

- The primary function of the endocrine system is to produce hormones. Because hormones are secreted directly into the bloodstream, they are able to reach cells and organs throughout the body.
- A **hormone** is a chemical messenger with a specialized function.

Steroid Hormones

- **Steroid hormones** help control metabolism, inflammation, immune functions, salt and water balance, development of sexual characteristics, and the ability to withstand illness and injury.

- The term **steroid** (**STEHR**-oid) describes both hormones produced by the body and artificially produced medications that duplicate the action of the naturally occurring steroids.

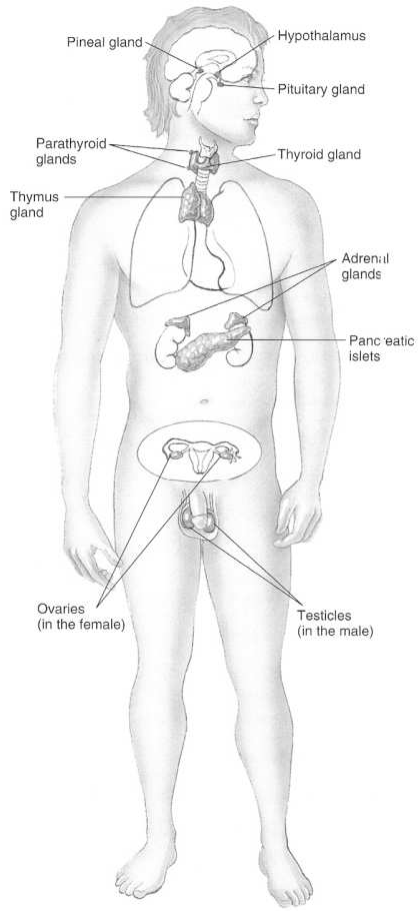

FIGURE 13.1 Structures of the endocrine system.

Anabolic Steroids

- **Anabolic steroids** (**an**-ah-**BOL**-ick **STEHR**-oidz), which are chemically related to the male sex hormone testosterone, have been used illegally by athletes to increase strength and muscle mass.
- Serious side effects of anabolic steroid use include liver damage, altered body chemistry, testicular shrinkage, and breast development in males, plus unpredictable mood swings and violence.
- Steroid use by teenagers also stops long bone development, resulting in shortened stature. The use of steroids usually can be detected through the testing of either blood or urine.

The Pituitary Gland

- The pea-sized **pituitary gland** (pih-**TOO**-ih-**tair**-ee) is located at the base of the brain just below the hypothalamus and is composed of anterior and posterior lobes.

Functions of the Pituitary Gland

- The primary function of the pituitary gland (also known as the **master gland**) is to secrete hormones that control the activity of the other endocrine glands.
- The pituitary acts in response to stimuli from the hypothalamus. This creates a system of checks and balances that maintains an appropriate blood level of each hormone.

Insufficient Thyroid Secretion

- **Hypothyroidism** (**high**-poh-**THIGH**-roid-izm), also known as an **underactive thyroid**, is a deficiency of thyroid secretion (**hypo-** means deficient, **thyroid** means thyroid, and **-ism** means condition). Symptoms include fatigue, depression, sensitivity to cold, and a decreased metabolic rate.

Excessive Thyroid Secretion

- **Hyperthyroidism** (**high**-per-**THIGH**-roid-izm) is a condition of excessive thyroid hormones in the bloodstream (**hyper-** means excessive, **thyroid** means thyroid, and **-ism** means condition). Symptoms include an increased metabolic rate, sweating, nervousness, and weight loss.

The Adrenal Glands

- The **adrenal glands**, also known as the **adrenals**, are located one on top of each kidney. Each adrenal gland is surrounded by an adrenal capsule and consists of two parts: the **adrenal cortex,** which is the outer portion, and the **adrenal medulla**, which is the middle portion.

Functions of the Adrenal Glands

- One of the primary functions of the adrenals is to control electrolyte levels within the body.
- **Electrolytes** (ee-**LECK**-troh-lyres) are mineral substances, such as sodium and potassium, which are normally found in the blood.
- Other important functions of the adrenal glands include helping to regulate metabolism and interacting with the sympathetic nervous system in response to stress.

Diabetic Emergencies

- Diabetic emergencies are due to either too much, or too little blood sugar. Treatment depends on accurately diagnosing the cause of the emergency.
- **Insulin shock** is caused by very low blood sugar (hypoglycemia). A sugary substance that can quickly be absorbed into the bloodstream is administered to rapidly raise the blood sugar level.
- **Diabetic coma** is caused by very high blood sugar (hyperglycemia). Also known as **diabetic ketoacidosis** (**kee**-toh-**ass**-ih-**DOH**-sis), this condition is treated by the prompt administration of insulin.

The Thymus

- The **thymus** (**THIGH**-mus) is located near the midline in the anterior portion of the thoracic cavity. It is posterior to (behind) the sternum and slightly superior to (above) the heart.

Functions of the Thymus

- The hormone secreted by the thymus plays an important role in the immune system.

The Gonads

- The **gonads** (**GOH-**nadz), which are ovaries in females and testicles in males, are the gamete-producing glands.

Functions of the Gonads

- The gonads secrete the hormones that are responsible for the development and maintenance of the secondary sex characteristics that develop during puberty.
- **Puberty** is the condition of first being capable of reproducing sexually. It is marked by maturing of the genital organs, development of secondary sex characteristics, and by the first occurrence of menstruation in the female. The average age at which puberty occurs is 14 in boys and 12 in girls.
- *Precocious puberty* is the early onset of the changes of puberty. This is before age 9 in females and before age 10 in males.

Secretions of the Testicles

- **Testosterone** (tes-**TOS**-teh-rohn), which is secreted by the testicles, stimulates the development of male secondary sex characteristics.

Secretions of the Ovaries

- **Estrogen** (**ES**-troh-jen) is important in the development and maintenance of the female secondary sex characteristics and in regulation of the menstrual cycle.
- **Progesterone** (proh-**JES**-ter-ohn) is the hormone released during the second half of the menstrual cycle by the corpus luteum in the ovary. Its function is to complete the preparations for pregnancy.
- If pregnancy occurs, the placenta takes over the production of progesterone.
- If pregnancy does not occur, secretion of the hormone stops and is followed by the menstrual period.

Matching Word Parts 1
Write the correct answer in the middle column.

	Definition	Correct Answer	Possible Answers
12.1	adrenal glands	_____	acr/o
12.2	extremities	_____	adren/o
12.3	ovaries or testicles	_____	crin/o
12.4	to secrete	_____	-dipsia
12.5	thirst	_____	gonad/o

Matching Word Parts 2
Write the correct answer in the middle column.

	Definition	Correct Answer	Possible Answers
12.6	pituitary	_____	-ism
12.7	pineal gland	_____	pancreat/o
12.8	pancreas	_____	parathyroid/o
12.9	parathyroid	_____	pineal/o
12.10	condition	_____	pituitar/o

Matching Word Parts 3
Write the correct answer in the middle column.

	Definition	Correct Answer	Possible Answers
12.11	to stimulate or act on	_____	poly-
12.12	thyroid gland	_____	somat/o
12.13	thymus, soul	_____	thym/o
12.14	many	_____	thyroid/o
12.15	body	_____	-tropin

Medical Terminology for Medical Assistants
Part XIII: The Lymphatic and Immune Systems

Overview Structures, Combining Forms, and Functions of the Lymphatic and Immune System

Major Structures	Related Combining Forms	Primary Functions
Lymph	lympho/o	Removes cellular waste products, pathogens, and dead blood cells from the tissues.
Lymph Vessels	lymphangi/o	Returns lymph to the circulatory system.
Lymph Nodes	lymphaden/o	Produce lymphocytes and filter harmful substances from lymph.
Tonsils and Adenoids	tonsil/o adenoid/o	Protect the entry into the respiratory system.
Spleen	splen/o (notice that this combining form is spelled with only one *e*.)	Filter foreign materials from the blood. Maintains the appropriate balance between cells and plasma in the blood. Destroys old worn-out blood cells, acts as a blood reservoir, and stores platelets.
Bone Marrow	myel/o	Produces blood cells.
Lymphocytes	lymphocyt/o	Plays a major role in the immune reaction.
Thymus	thym/o	Stimulates metabolism, growth, and the activity of the nervous system.
Immune System	immun/o	Defends the body against harmful substances, such as pathogenic microorganisms, allergens, toxins, and malignant cells.

Medical Specialties Related to the Lymphatic and Immune Systems

- An **allergist** (**AL**-er-jist) specializes in diagnosing and treating conditions of altered immunologic reactivity, such as allergic reactions.
- A **hematologist** (**hee**-mah-**TOL**-oh-jist) specializes in diagnosing and treating diseases and disorders of the blood and blood-forming tissues (**hemat** means blood and **-ologist** means specialist).
- An **immunologist** (**im**-you-**NOL**-oh-jist) specializes in diagnosing and treating disorders of the immune system (**immun** means protected and **-ologist** means specialist).
- An **oncologist** (ong-**KOL**-oh-jist) specializes in diagnosing and treating malignant disorders such as tumors and cancer (**onc** means tumor and **-ologist** means specialist).

Functions of the Lymphatic System

- The lymphatic system has three primary functions. These are to:
- Absorb fats and fat-soluble vitamins from the digestive system and transport them to the cells.
- Remove cellular waste products from the tissues, then to filter and return this excess tissue fluid to the circulatory system.
- Fill important roles as part of the immune system.

The Tonsils

- The **tonsils** (**TON**-sils) are masses of lymphatic tissue that form a protective ring around the nose and upper throat. These lymphatic tissues play an important role in the immune system.

Pathogenic Organisms

- A **pathogen** (**PATH**-oh-jen) is a microorganism that causes a disease. A *microorganism* is a living organism that is so small it can be seen only with the aid of a microscope.

Bacteria

- **Bacteria** (back-**TEER**-ree-ah) are a group of one-celled microscopic organisms (singular is **bacterium**). The pathogenic types of bacteria include: bacilli, rickettsia, spirochetes, staphylococci, and streptococci.
- **Bacilli** (bah-**SILL**-eye) (singular, **bacillus**), are rod-shaped spore-forming bacteria. **Tetanus** and **tuberculosis** are caused by bacilli.
- A **rickettsia** (rih-**KET**-see-ah) is a small bacterium that lives in lice, fleas, and mice (plural, rickettsiae). **Rocky Mountain spotted fever**, which is caused by *Rickettsia rickettsii*, is transmitted to humans by the bite of an infected tick.
- **Spirochetes** (**SPY**-roh-keets) are spiral-shaped bacteria that have flexible walls and are capable of movement. **Lyme disease**, which is caused by the spirochete *Borrelia burgdorferi*, is transmitted to humans by the bite of an infected deer tick.
- **Staphylococci** (**staf**-ih-**KOCK**-sigh) are bacteria that form irregular groups or clusters (singular, staphylococcus). *Staphylococcus aureus* causes a variety of pus-forming infections and superficial skin lesions such as boils and furuncles.

- **Streptococci** (**strep**-toh-**KOCK**-sigh) are bacteria that form a chain (singular, **streptococcus**). **Severe pharyngitis**, commonly known as a **strep throat**, is caused by *Group A streptococci***.**

Fungus, Yeast, and Parasites

- A **fungus** (**FUNG**-gus) is a simple parasitic plant. Some of these plants are harmless to humans and others are pathogenic (plural, **fungi**). **Aspergillosis** (**ass**-per-jil-**OH**-sis), which is an infection caused by a fungus of the genus *Aspergillus*, may cause inflammation and lesions on, or in, any organ. A lesion is a pathologic change of the tissues due to disease or injury.
- **Yeast** is a type of fungus. **Moniliasis** (mon-ih-**LYE**-ah-sis), which is caused by the pathogenic yeast *Candida albicans*, is an infection of the skin or mucous membranes. These infections are usually localized in the mouth or the vagina.
- A **parasite** (**PAR**-ah-sight) is a plant or animal that lives on or within another living organism at the expense of that organism. **Malaria** (mah-**LAY**-ree-ah), which is caused by a parasite that lives within certain mosquitoes, is transferred to humans by the bite of an infected mosquito.

Viruses

- **Viruses** (**VYE**-rus-ez) are very small infectious agents that live only by invading cells (singular, **virus**). Within the cell, the virus reproduces and then breaks the cell wall. The newly formed viruses are released so they can spread to other cells. A virus can be prevented with the use of a vaccine. Antibiotics are not effective against a virus.

Viral Infections

- **Cytomegalovirus** (**sigh**-toh-**meg**-ah-loh-**VYE**-rus) is a group of large herpes-type viruses that cause a variety of diseases (**cyt/o** means cell, **megal/o** means large, **vir** means virus, and **-us** is a singular noun ending).
- **Infectious mononucleosis** (**mon**-oh-**new**-klee-**OH**-sis), which is caused by the **Epstein-Barr virus**, is characterized by fever, a sore throat, and enlarged lymph nodes.
- **Measles** is an acute, highly contagious infection caused by the rubeola virus and transmitted by respiratory droplets. Symptoms include fever, malaise, nasal congestion, a cough, photophobia, and a rash over the entire body. *Photophobia* means sensitivity to light. Complications of measles can be serious. Compare measles with *rubella*.
- **Mumps** is an acute viral disease characterized by the swelling of the parotid glands. The parotid glands are salivary glands located on the face just in front of the ears.
- **Rabies** (**RAY**-beez) is an acute viral infection that may be transmitted to humans by the blood, tissue, or saliva of an infected animal.
- **Rubella** (roo-**BELL**-ah), also known as **German measles** or **3-day measles**, is a viral infection characterized by fever and a diffuse, fine, red rash. If the mother has rubella during the early stages of pregnancy, the disease may cause congenital abnormalities in the developing child. Compare rubella with *measles*.
- **Varicella** (var-ih-**SEL**-ah) (**VZV**), also known as **chickenpox**, is caused by the herpes virus *Varicella zoster* and is highly contagious. VZV is characterized by fever and an itchy rash that eventually forms crusted scabs.

- **Herpes zoster** (**HER**-peez **ZOS**-ter), also known as **shingles**, is an acute viral infection characterized by painful skin eruptions that follow the underlying route of the inflamed nerve. This inflammation occurs when the dormant chickenpox virus is reactivated later in life. The duration of an outbreak is shortened by prompt treatment with antiviral drugs.
- The **West Nile virus**, which causes flu like symptoms, is carried by birds and transmitted to humans by mosquito or tick bites. If untreated, the inflammation can spread to the spinal cord and brain.

Medications to Control Infections

- **Antibiotics** are chemical substances capable of inhibiting growth or killing pathogenic microorganisms (**anti-** means against, **bio** means life, and **-tic** means pertaining to). *Inhibit* means to slow the growth or development. Antibiotics are used to combat bacterial infections; however, they are not effective against viruses.
- A **bactericide** (back-**TEER**-ih-sighd) is a substance that causes the death of bacteria (**bacteri** means bacteria and **-cide** means causing death). Bactericides include the antibiotic groups of penicillins and cephalosporins.
- A **bacteriostatic** (bac-**tee**-ree-oh-**STAT**-ick) is an agent that slows or stops the growth of bacteria (**bacteri** means bacteria and **-static** means causing control). Bacteriostatics include tetracycline, sulfonamide, and erythromycin.
- An **antifungal** (**an**-tih-**FUNG**-gul) is an agent that destroys or inhibits the growth of fungi (**anti-** means against, **fung** means fungus, and **-al** means pertaining to). Lotrimin is an example of a topical antifungal that is applied to treat or prevent athlete's foot. This type of medication is also known as an **antimycotic** (**an**-tih-my-**KOT**-ick) (**anti-** means against, **myc/o** means fungus, and **-tic** means pertaining to).
- An **antiviral drug** (**an**-tih-**VYE**-ral), such as acyclovir, is used to treat viral infections or to provide temporary immunity (**anti-** means against, **vir** means virus, and **-al** means pertaining to).

Carcinomas

- A **carcinoma** (**kar**-sih-**NOH**-mah) is a malignant tumor that occurs in epithelial tissue (**carcin** means cancer and **-oma** means tumor). Epithelial tissue forms the protective covering for all of the internal and external surfaces of the body.

Sarcomas

- A **sarcoma** (sar-**KOH**-mah) is a malignant tumor that arises from connective tissue (**sarc** means flesh and **-oma** means tumor) (plural, **sarcomas** or **sarcomata**).

Lymphomas

- **Lymphoma** (lim-**FOH**-mah) is a general term applied to malignancies that develop in the lymphatic system (**lymph** means lymph and **-oma** means tumor). The involved tissues include lymph nodes, spleen, liver, and bone marrow. The two most common types of lymphomas are Hodgkin's lymphoma and non- Hodgkin's lymphoma.

Breast Cancer

- Breast cancer is a malignant tumor that develops from the cells of the breast and may spread to adjacent lymph nodes and other body sites.

Types of Breast Cancer

- **Invasive ductal carcinoma**, also known as **infiltrating ductal carcinoma**, starts in the milk duct, breaks through the wall of that duct, and invades fatty breast tissue. This form of cancer accounts for the majority of all breast cancers.
- **Ductal carcinoma in situ** is breast cancer at its earliest stage (stage 0) before the cancer has broken through the wall of the milk duct. At this stage, the cure rate is nearly 100 percent.
- **Invasive lobular carcinoma**, also known as **infiltrating lobular carcinoma**, is cancer that starts in the milk glands (lobules), breaks through the wall of the gland, and invades the fatty tissue of the breast. Once the cancer reaches the lymph nodes, it can rapidly spread to distant parts of the body.
- **Male breast cancer** can occur in the small amount of breast tissue that is normally present in men. The types of cancers are similar to those occurring in women.

Detection of Breast Cancer

- Early detection is possible through breast self-examination mammograms, and professional palpation. A preliminary diagnosis is confirmed by biopsy.
- A **biopsy** (**BYE**-op-see) is the removal of a small piece of living tissue for examination to confirm or establish a diagnosis (**bi-** means pertaining to life and **-opsy** means view of). After a diagnosis has been established, treatment is then based on the stage of the cancer.
- A **needle breast biopsy** is a technique in which an x-ray guided needle is used to remove small samples of tissue from the breast. It is less painful, less disfiguring (no scarring), and requires a shorter recovery time than surgical biopsy.
- **Lymph node dissection** is a diagnostic procedure in which all of the lymph nodes in a major group are removed to determine the spread of cancer. For example, an *axillary lymph node dissection* (ALND) is performed to diagnose the spread of breast cancer.

Matching Word Parts 1

Write the correct answer in the middle column.

Definition	Correct Answer	Possible Answers
13.1 lymph node	_____	carcin/o
13.2 lymph vessel	_____	lymphaden/o
13.3 eat, swallow	_____	lymphangi/o
13.4 cancer	_____	phag/o
13.5 poison	_____	tox/o

Matching Word Parts 2
Write the correct answer in the middle column.

Definition	Correct Answer	Possible Answers
13.6 formation	_____	immune/o
13.7 flesh	_____	onc/o
13.8 protected, safe	_____	-plasm
13.9 spleen	_____	sarc/o
13.10 tumor	_____	splen/o

Matching Structures
Write the correct answer in the middle column.

Definition	Correct Answer	Possible Answers
13.11 acts as a physical barrier	_____	lymph nodes
13.12 filter harmful substances from lymph	_____	skin
13.13 has roles in lymphatic and endocrine systems	_____	spleen
13.14 lymphatic tissue hanging from the lower portion of the Cecum	_____	thymus
13.15 stores extra erythrocytes	_____	vermiform appendix

Part I

1.1 dys-
1.2 hyper-
1.3 hepat/o
1.4 –algia
1.5 –ecotmy
1.6 –osis
1.7 –malacia
1.8 hypo-
1.9 –itis
1.10 –necrosis
1.11 –rrhage
1.12 –ostomy
1.13 –otomy
1.14 –plasty
1.15 –rrhaphy
1.16 –scopy
1.17 –rrhexis
1.18 –stenosis
1.19 –sclerosis
1.20 –rrhea
1.21 palpation
1.22 prostate
1.23 lesion
1.24 palpitation
1.25 laceration
1.26 gastrosis
1.27 cardiac
1.28 myorrhexis
1.29 gastralgia
1.30 myoplasty
1.31 cardiologist
1.32 rhinorrhea
1.33 arthritis
1.34 neonatologist
1.35 neurotomy
1.36 arthroscopy
1.37 arteritis
1.38 neuralgia
1.39 cardiotomy
1.40 rhinitis

Part II

2.1 coron/o
2.2 adip/o
2.3 aden/o
2.4 home/o
2.5 cephal/o
2.6 endo-
2.7 epi-
2.8 cyt/o
2.9 exo-
2.10 hist/o
2.11 –ac
2.12 –stasis
2.13 path/o
2.14 –plasm
2.15 retr/o
2.16 epigastric
2.17 umbilicus
2.18 hypochondriac
2.19 hypogastric
2.20 iliac
2.21 proximal
2.22 posterior
2.23 coronal
2.24 midsagittal
2.25 distal
2.26 myoplasty
2.27 neuralgia
2.28 gastrosis
2.29 laryngitis
2.30 myectomy
2.31 gastralgia
2.32 laryngectomy
2.33 nephrosis
2.34 neuroplasty
2.35 nephritis
2.36 hypochondriac
2.37 umbilical
2.38 hypogastric
2.39 lumbar
2.40 iliac
2.41 midsagittal
2.42 anterior
2.43 lateral
2.44 posterior

2.45 coronal

Part II A

WP.1 dys-
WP.2 inter-
WP.3 hypo-
WP.4 hyper-
WP.5 intra-
WP.6 supra-
WP.7 pre-
WP.8 poly-
WP.9 peri-
WP.10 sub-
WP.11 -itis
WP.12 -algia
WP.13 -graphy
WP.14 -centesis
WP.15 -ecotmy
WP.16 -plasty
WP.17 -malacia
WP.18 -dynia
WP.19 -necrosis
WP.20 -oma
WP.21 -osis
WP.22 -sclerosis
WP.23 -otomy
WP.24 -ac
WP.25 -ostomy
WP.26 -rrhea
WP.27 -stenosis
WP.28 -rrhagia
WP.29 -rrhexis
WP.30 -rrhaphy
WP.31 false
WP.32 true
WP.33 false
WP.34 true
WP.35 false
WP.36 true
WP.37 false
WP.38 true
WP.39 false
WP.40 rhinorrhea
WP.41 nephrectomy
WP.42 otitis
WP.43 cardiomegaly
WP.44 hepatitis
WP.45 arthroscopy
WP.46 urologist
WP.47 hematology
WP.48 colotomy
WP.49 phlebitis
WP.50 electrocardiogram

Part III

3.1 -ectasis
3.2 laryng/o
3.3 bronch/o
3.4 cyan/o
3.5 atel/o
3.6 pneum/o
3.7 ox/o
3.8 pleur/o
3.9 pharyng/o
3.10 phon/o
3.11 trache/o
3.12 tachy-
3.13 pulmon/o
3.14 –thorax
3.15 –pnea
3.16 acute respiratory syndrome
3.17 chronic obstructive pulmonary disease
3.18 sudden acute respiratory syndrome
3.19 sudden infant death syndrome
3.20 upper respiratory infection
3.21 false
3.22 true
3.23 false
3.24 true
3.25 true
3.26 pharyngorrhea
3.27 pneumonitis
3.28 laryngologist
3.29 laryngorrhagia
3.30 pharyngolaryngitis
3.31 tracheostenosis
3.32 bronchoplasty
3.33 epiglottitis
3.34 tracheobronchoscopy

3.35 bronchoplegia

Part IV

4.1 kinesi/o
4.2 –cele
4.3 fibr/o
4.4 fasci/o
4.5 –ia
4.6 ton/o
4.7 tend/o
4.8 –rrhexis
4.9 my/o
4.10 tax/o
4.11 transverse
4.12 sphincter
4.13 oblique
4.14 rectus
4.15 lateralis
4.16 myopathy
4.17 polymyalgia
4.18 myonecrosis
4.19 fasciorrhaphy
4.20 myotomy
4.21 fasciodesis
4.22 myocarditis
4.23 fasciectomy
4.24 herniorrhaphy
4.25 sphincterotomy

Part VI

6.1 aort/o
6.2 arteri/o
6.3 ather/o
6.4 angi/o
6.5 brady-
6.6 –emia
6.7 coron/o
6.8 cardi/o
6.9 erythr/o
6.10 ven/o
6.11 leuk/o
6.12 phleb/o
6.13 tachy-
6.14 thromb/o
6.15 hem/o
6.16 heart
6.17 myocardium
6.18 epicardium
6.19 endocardium
6.20 pericardium

Part VII

7.1 cystostomy
7.2 nephrotomy
7.3 nephrosclerosis
7.4 cystoptosis
7.5 urethrocele
7.6 ureterolysis
7.7 nephromalacia
7.8 pyelonephritis
7.9 cystorrhexis
7.10 cystoplasty

Part XIII

8.1 gastrorrhaphy
8.2 esophagalgia
8.3 sigmoidectomy
8.4 proctalgia
8.5 gastropexy
8.6 sigmoiditis
8.7 esophagogastrectomy
8.8 hepatoenteric
8.9 hepatomegaly
8.10 gastroenterocolitis

Part IX

9.1 encephal/o
9.2 contus/o
9.3 concuss/o
9.4 ech/o
9.5 ambul/o
9.6 mening/o
9.7 –esthesia
9.8 myel/o
9.9 klept/o
9.10 cephal/o
9.11 –phobia
9.12 psych/o
9.13 neur/o
9.14 somn/o
9.15 narc/o
9.16 brainstem

9.17 cerebrum
9.18 medulla
9.19 cerebellum
9.20 hypothalamus

Part X

10.1 kerat/o
10.2 –metry
10.3 belphar/o
10.4 –cusis
10.5 opt/o
10.6 ophthalm/o
10.7 myring/o
10.8 irid/o
10.9 presby/o
10.10 –opia
10.11 retin/o
10.12 scler/o
10.13 trop/o
10.14 ot/o
10.15 tympan/o
10.16 strabismus
10.17 myopia
10.18 hyperopia
10.19 diplopia
10.20 esotropia
10.21 iridalgia
10.22 blepharitis
10.23 iridotomy
10.24 retinopathy
10.25 ophthalmology
10.26 blepharedema
10.27 lacrimotomy
10.28 labyrinthectomy
10.29 iridopathy
10.30 retinitis

Part XI

11.1 kyph/o
11.2 chondr/o
11.3 ankly/o
11.4 arthr/o
11.5 –um
11.6 crani/o
11.7 cost/o
11.8 –lysis
11.9 myel/o
11.10 –desis
11.11 spondyl/o
11.12 scoli/o
11.13 lodr/o
11.14 synovi/o, synov/o
11.15 oste/o
11.16 sternum
11.17 zygomatic
11.18 clavicle
11.19 patella
11.20 olecranon

Part XII

12.1 adren/o
12.2 acr/o
12.3 gonad/o
12.4 crin/o
12.5 –dipsia
12.6 pituiter/o
12.7 pineal/o
12.8 pancreat/o
12.9 parathyroid/o
12.10 –ism
12.11 –tropin
12.12 thyroid/o
12.13 thym/o
12.14 poly/o

Part XIII

13.1 lymphaden/o
13.2 lymphangi/o
13.3 phag/o
13.4 carcin/o
13.5 tox/o
13.6 –plasm
13.7 sarc/o
13.8 immun/o
13.9 splen/o
13.10 onc/o
13.11 skin
13.12 lymph nodes
13.13 thymus
13.14 vermiform appendix